REMARKS

In a final Office Action dated May 13, 20109, the Examiner rejected claims 6-9, 23-26, and 28-43 under 35 U.S.C. §102(e) as anticipated by Clarke et al. (U.S. Patent Publication 20040221038).

Prior Art

The claims are unamended. Applicants respectfully traverse the rejections of the claims.

Applicants herewith submit a Statement Regarding Common Ownership. While the Examiner has not explicitly rejected the claims under 35 U.S.C. §103, the Statement is submitted to obviate any potential or subsumed rejection of the claims as obvious in view of the cited reference under 35 U.S.C. §103. Applicants do not concede that the present claims would have been obvious in view of *Clarke* under 35 U.S.C. §103, but make this statement in the interests of furthering prosecution herein. In view of common ownership, a rejection based on *Clarke* can only be maintained under 35 U.S.C. §102(e), i.e., each and every element of the claims must be disclosed by the *Clarke* reference alone.

As explained previously, applicants' invention relates to the scheduling of computer resources in an environment where at least some of the resources are fee-based, i.e. there is a direct, financial cost associated with their use. The exemplary embodiment involves a fee-based distributed computing system (grid system), in which computing resource can be purchased on demand. The fees for purchasing resource could vary by time of day and/or day of week, or according to how busy the system is or other factors. In an exemplary embodiment, a local computer system or network, such as an in-house computer system within an enterprise, provides a limited amount of processing capability and is connected to the fee-based computing system for

additional on-demand computing capacity. Other variations of this exemplary embodiment are possible.

Although various conventional techniques exist for prioritizing tasks and allocating resources in a data processing environment, applicants' invention is directed to a very specific application, in which a decision must be made whether to acquire fee-based resources to perform specific tasks based on economic justification.

Applicants provide a system in which both resource allocation and the amount of work done are variable according to relative economic cost. In accordance with applicants' system, a respective financial valuation is assigned to each of multiple data processing tasks ("work items", "programs", etc.) to be performed by a computer system or collection of computer systems, the financial valuation being specific to each task. This value is intended to represent some theoretical corresponding financial value associated with having the task done now as opposed to later. These financial values are compared to the cost of obtaining resources necessary to complete the task now, e.g., the fee charged for accessing an external computing grid to perform the work. If the cost exceeds the value, the task is deferred; if not, the resource is obtained to perform the task now, and the resultant cost is incurred. In the exemplary embodiment, the highest valued tasks are first assigned to the in-house system, and to the extent there are tasks left over, a determination is made whether to purchase external on-demand computing resources on a task-by-task basis, it being possible that all, some or none of the tasks will justify the purchase of additional computing resource. By deferring less "valuable" jobs, greater flexibility is achieved to process these jobs at a time when the fees are lower, or when in-house computing resources are idle so that no fee is required.

Therefore, significant features of applicants' invention are that *a respective financial valuation* is associated with each of a plurality of tasks to be performed by a computer system ("work items", "programs", etc.), that this *financial valuation is compared to a respective cost* of the computing resources required to do the work, and that the scheduler *selectively accesses the resources or defers processing* based on this comparison. Applicants' representative claim 6, as amended, recites:

6.   A computer-implemented method for managing access to computer resources, the method comprising:
(a) *defining a respective financial valuation of each of a plurality of work items* to be processed by one or more data processing systems;
(b) *comparing the respective financial valuation of each respective said work item to a respective cost of accessing additional computer resources* necessary to process the work item in a current time period, said additional computer resources being external to said one or more data processing systems;
(c) with respect to each said work item for which the *respective financial valuation of the work item exceeds the respective cost* of accessing additional computer resources necessary to process the work item in the current time period, dynamically accessing additional computer resources necessary to process the work item in the current time period;
(d) with respect to each said work item for which the *respective financial valuation of the work item does not exceed the respective cost* of accessing additional computer resources necessary to process the work item in the current time period, deferring processing of the work item to a subsequent time period; and
(e) repeating said (b) through (d) in one or more subsequent time periods with respect to each said work item deferred by said (d) until each said work item has been processed.   [emphasis added]

The remaining independent claims vary in scope, but all contain limitations analogous to the italicized limitations above[2].

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[2] Independent claim 23 does not recite "additional computer resources", but recites a method of providing fee-based processing, in which the financial valuation is compared with the projected fee for utilization of computer resources. Various other differences exist, but all claims recite associating financial valuations with work items or tasks, and making comparisons and accessing resources based on the financial valuations.

Docket No.:   ROC920030052US1
Serial No.:   10/824,054

Clarke discloses a system for configuring a distributed processing computing system. In accordance with *Clarke*, a distributed computing system is configured so as to maximize its value determined in accordance with some value criteria, such as a predicted "return on investment" (ROI). In other words, one or more valuation metrics are established for various hardware and software components of a system, a system value is determined in response to these metrics, and elements of a distributed computing environment are re-configured according to the determined valuations. Valuation can be based on a variety of financial data.

Although *Clarke* discloses the high-level concept of taking financial considerations into account in managing a computer system, they do not disclose the particular application of the general concept which is disclosed and claimed herein by applicants

Specifically, *Clarke* does not disclose "...*defining a respective financial valuation of each of a plurality of work items to be processed*...", as recited in claim 6. The passage from *Clarke* which the Examiner cites as a teaching of this limitation only discloses the general use of a variety of financial data[3]. Specifically, *Clarke* discloses that this financial data "is shown as being provided to the aggregation point 240 but may be provided directly to the value determining element 260, change determining element 270, or aggregated with other data..." There is no disclosure that *each* of a plurality of work items is assigned a *respective* financial valuation.

Nor does *Clarke* disclose "...*comparing the respective financial valuation of each respective said work item to a respective cost of accessing additional computer resources* necessary to process the work item in a current time period...", as recited in claim 6. Again, the passages from *Clarke* cited by the Examiner discloses something quite different, i.e., that a

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[3] *Clarke* ¶[0044]

Docket No.:   ROC920030052US1
Serial No.:   10/824,054

"change determining process" uses values determined by a "value determining process" to determine whether a change is advisable;[4] that responsive to metrics collected and a determined value, a determination is made whether a change in the distributed computing environment is advisable, alternate values being based on potential changes to workload and configuration;[5] that as an example, utilization is monitored based on a load, and from the value of the currently running application it is determined that additional external compute work can be accepted.[6] At a very high level of abstraction, applicants are doing something similar. However, it is not the high level of abstraction, but applicants' claim language, which controls. Applicants' claim language recites something far more specific, that financial valuations of the respective work items are compared to cost of doing the work in a current time interval. Except for the general use of financial data to configure a system, and the disclosure that alternate values can be based on, among other things, "potential changes to workload", *Clarke* discloses none of these specific limitations.

Similarly, *Clarke* does not disclose dynamically accessing additional resources or deferring execution of a work item to a subsequent time period based on the comparison of financial value to cost. In addition to the passages above mentioned, *Clarke* discloses that if an application is deemed to be causing congestion, its priority may be reduced.[7] Although this may (although will not necessarily) cause it to complete execution later, this does not amount to deferring execution to a subsequent time period, nor is reduction in priority performed in response to any comparison of financial value of the work item with the cost of obtaining additional

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[4]   *Clarke*, ¶[0046]

[5]   *Clarke*, ¶[0055]

[6]   *Clarke* ¶[0056]

[7]   *Clarke* ¶[0065]

Docket No.:   ROC920030052US1
Serial No.:   10/824,054

resource to perform the item in the current time interval; it is merely a load balancing action to prevent one application from monopolizing available resources.

Essentially, *Clarke* is configuring a system from the perspective of the provider of computing resources. In this environment, computing resources are simply a product or service which is sold at a price to external entities. *Clarke* is concerned with maximizing the return on investment, which significantly includes the revenue which can be derived from providing computing resources. Applicants' invention involves a technique for use in a consumer of fee-based computing resources, in which a decision must be made whether to purchase resources from a provider to complete certain work items. While the two techniques are related and both involve the use of financial considerations, they are not the same. As explained earlier, obviousness of one in view of the other, even if assumed, is not a basis for a rejection of applicants' claims. *Clarke* must disclose the very same elements of the claims as recited, and this *Clarke* does not do for the reasons stated above.

In view of the foregoing, applicants submit that the claims are now in condition for allowance and respectfully request reconsideration and allowance of all claims. In addition, the

Examiner is encouraged to contact applicants' attorney by telephone if there are outstanding issues left to be resolved to place this case in condition for allowance.

Respectfully submitted,

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